1   **REBUTTAL TESTIMONY**

2   **OF**

3   **JOSEPH M. LYNCH**

4   **ON BEHALF OF**

5   **SOUTH CAROLINA ELECTRIC & GAS COMPANY**

6   **DOCKET NO. 2014-246-E**

7

8 **Q.** **PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.**

9 A.   My name is Joseph M. Lynch, and my business address is 220 Operation

10 Way, Cayce, South Carolina.

11 **Q.** **ARE YOU THE SAME JOSEPH LYNCH WHO HAS PREVIOUSLY**

12   **FILED TESTIMONY IN THIS DOCKET?**

13 A.   Yes.

14 **Q.** **ARE YOU FAMILIAR WITH THE SETTLEMENT AGREEMENT**

15   **ENTERED INTO BY MULTIPLE PARTIES IN THIS PROCEEDING?**

16 A.   Yes. I have read and reviewed the settlement agreement (Settlement

17 Agreement) signed by the Office of Regulatory Staff (ORS), South Carolina

18 Electric & Gas Company (SCE&G), Duke Energy Carolinas, LLC, Duke Energy

19 Progress, Inc., the Coastal Conservation League (CCL), the Southern Alliance for

20 Clean Energy (SACE) and others. It was filed with the South Carolina Public

1   Service Commission (Commission) on December 11, 2014. My testimony is

2   intended in all respects to support the Settlement Agreement and demonstrate that

3   it comports with sound regulatory policy.

4 Q.   **CCL, SACE AND OTHERS SIGNED THE SETTLEMENT AGREEMENT.**

5   **WHY THEN ARE YOU FILING TESTIMONY IN RESPONSE TO**

6   **ISSUES RAISED BY THEM?**

7 A.   CCL, SACE and others have included language in their direct testimony

8   indicating that they support the Settlement Agreement. But the body of their

9   testimony contains positions and request for rulings by the Commission that go

10   beyond the Settlement Agreement and are in direct contradiction to it. The

11   purpose of my testimony is to point out certain matters that fall within my area of

12   expertise.

13 Q.   **IN   HIS   AMENDED   DIRECT   TESTIMONY,   JOHN   WILSON**

14   **RECOMMENDS   USE   OF   THE   EFFECTIVE   LOAD   CARRYING**

15   **CAPABILITY (ELCC) METHOD AND ON PAGE 12, LINE 8, STATES**

16   **THAT "IT IS . . . IMPORTANT THAT SCE&G CONDUCT AN ELCC**

17   **STUDY." IS THIS RECOMMENDATION CONSISTENT WITH THE**

18   **SETTLEMENT AGREEMENT AND DOES SCE&G SUPPORT THE USE**

19   **OF THE ELCC METHOD?**

1   A.   The ELCC method is not mentioned in the Settlement Agreement. Instead,

2   the Settlement Agreement affirmatively states that avoided capacity costs shall be

3   computed consistent with the utilities' calculations of avoided costs under the

4   Public Utility Regulatory Policies Act (PURPA) and the calculations contained in

5   the utilities' Integrated Resource Plans (IRPs). As discussed below, the ELCC is

6   not a primary methodology used by SCE&G in either context. Therefore,

7   advocating it as the primary method for use in calculating net energy metering

8   (NEM) rates is inconsistent with the Settlement Agreement. Furthermore

9   determination of the percentage of firm capacity assigned to a distributed energy

10   resource (DER) is utility-specific and hence more appropriately addressed when

11   each utility files to have a NEM rate approved and not here in a generic docket

12   using indicative calculations. Finally SCE&G does not support the use of the

13   ELCC method for evaluating DER profiles. The ELCC method depends on loss of

14   load probability (LOLP) methodology with some inherent weaknesses and is

15   overly complex.

16   Q.   **WHAT ARE SOME OF THESE WEAKNESSES IN THE LOLP**

17   **METHODOLOGY?**

18   A.   The LOLP methodology begins with a generating unit's forced outage rate

19   (FOR) and approximates the reliability characteristics of the unit by a simple

20   binomial "available/not available" probability distribution. A detailed reliability

3

1   analysis of a generating unit might include more complexity such as the expected

2   time-to-failure of various key components and expected time-to-repair. Also the

3   LOLP methodology assumes that the unit's probability of being available is

4   independent of the operating state of the unit. But of course a peaking turbine that

5   has been operating for several hours will have a higher likelihood of availability in

6   the coming hour than if it had to be cranked from a cold start. It should be clear

7   from the above that the LOLP methodology is from the start an approximation.

8   The LOLP method uses a convolution algorithm to combine all the

9   binomial probability distributions into a system capacity outage probability

10   distribution. The problem here is that convolution requires independent

11   probability distributions. While many of the units on the system are mechanically

12   independent, they are not statistically independent. For example, an arctic blast

13   covering the system or a bout of torrential rains causing wet coal problems are

14   likely to affect more than one unit resulting in correlated and dependent

15   probability distributions. Use of the convolution process means another layer of

16   approximations in the LOLP methodology.

17   The LOLP method calculates the probability of not meeting the load in

18   each hour of the year and then sums all the calculations to derive the LOLP index

19   which would yield the expected number of hours of outage per year. The method

20   assumes that each hour is independent which is not correct. For example, the

1   probability of not meeting a 4,000 megawatt (MW) load will be different if the

2   load represents an increase of only a few MWs from the prior hour as opposed to a

3   few hundred. Similarly a decrease of a few hundred MWs has different

4   consequences for the ability to serve load than the same increase.

5 Q. **WHY DO SOME IN THE INDUSTRY RELY ON THE LOLP**

6   **METHODOLOGY AND THE ELCC APPLICATION IF IT HAS**

7   **WEAKNESSES?**

8 A.   The LOLP methodology has a natural appeal because it combines the

9   reliability of generation and the uncertainty of load and is shrouded within the

10   theory of probability and statistical formula. When conducting a research study

11   that requires a fixed standard of reliability, LOLP is a natural choice. However it

12   should always be kept in mind that it has weaknesses and provides only an

13   approximation. SCE&G has calculated LOLP in reliability studies and uses the

14   results as one point of reference among others, as another data point to consider.

15   SCE&G would be very hesitant to make a decision based solely on an LOLP

16   calculation. In the present context where a measure of firm capacity of a DER is

17   involved, SCE&G opposes its use especially since there are much better methods

18   available.

1 Q. **MR. WILSON PROPOSED HIS SYSTEM PEAK HOURS (SPH) METHOD**

2 **AS AN ALTERNATIVE TO ELCC (PAGE 7, LINE 11). DOES SCE&G**

3 **OBJECT TO THIS METHOD AS WELL?**

4 A. Yes, we object to the method as an alternative to ELCC. Determining the

5 firm capacity level of a DER is a utility specific calculation which will be a

6 function of its system load profile, various weather conditions such as solar

7 radiation, cloud cover, wind speed -- all depending in part on the geographic

8 location of the service territory. The determination of firm capacity level for a

9 DER is more properly addressed in the docket where each utility files its actual

10 NEM rate.

11 Q. **DR. VITOLO IN HIS AMENDED DIRECT TESTIMONY ALSO**

12 **ADVOCATED USE OF THE ELCC METHOD AND THE ALTERNATIVE**

13 **SPH METHOD. DO YOUR COMMENTS REGARDING THESE ISSUES**

14 **APPLY EQUALLY TO THIS ASPECT OF DR. VITOLO'S COMMENTS?**

15 A. Yes, SCE&G maintains that this is not the appropriate docket to address the

16 firm capacity value of a DER and is opposed to using either the ELCC method or

17 the SPH method in any case.

18 Q. **ON PAGE 7, LINE 19, OF HIS AMENDED DIRECT TESTIMONY, DR.**

19 **VITOLO RECOMMENDS "WHEN CALCULATING ANY OF THE**

20 **COSTS OR AVOIDED COSTS ASSOCIATED WITH SOLAR**

1   **PHOTOVOLTAICS (PV), A 25-YEAR TIMEFRAME SHOULD BE**

2   **USED...." DO YOU AGREE?**

3   A.   No, I do not. This recommendation is inconsistent with the Settlement

4   Agreement. By referring to the IRP process as a standard, the Settlement

5   Agreement authorizes the use of the 15-year planning horizon that has been set as

6   a standard for use in the IRP process for some time. Furthermore, the 15 year

7   planning horizon is a more natural planning horizon over which to calculate

8   avoided cost than 25 years. Fifteen years strikes a reasonable balance between a

9   shorter time frame, over which data is more certain, and a longer time frame,

10   which measures the effects of cost parameters over a longer duration. This is

11   particularly true for purposes calculating avoided costs for solar PV resources. An

12   increasing penetration of solar PV will result in declining benefits from adding

13   additional solar PV resources. For that reason, among others, twenty-five years is

14   simply too long for calculating avoided costs. Furthermore, the proposed NEM

15   process envisions updating the avoided cost calculations every year as we move

16   forward. Therefore, NEM rates will recognize any avoided costs that are present

17   beyond the 15-year planning horizon in any given year as those benefits come

18   within the 15 year planning horizon in later years. Accordingly, no benefits are

19   lost.

1 Q. ON PAGE 8, LINE 6, OF HIS AMENDED DIRECT TESTIMONY, DR.

2 VITOLO SAYS "THE INCLUSION OF CO_2 COSTS IS APPROPRIATE

3 BECAUSE THE CLEAN POWER PLAN REPRESENTS AN IMMINENT,

4 MEASURABLE OBLIGATION TO THE UTILITIES OF SOUTH

5 CAROLINA." DO YOU AGREE?

6 A. No, I do not. This is not consistent with the Settlement Agreement which

7 proscribes adding the avoided cost of CO_2 until such time as there are actual

8 financial costs to be avoided. That is not the case today. The regulations related to

9 CO_2 that are being promulgated under the Clean Power Plan are not finalized yet

10 but are under review by the US Environmental Protection Agency. Furthermore,

11 the regulations when adopted will set goals for the State of South Carolina and not

12 goals that apply directly to utilities. The State will have to issue an Implementation

13 Plan that will set targets for the individual utilities. The utilities will have to

14 comply with that plan. The terms of that plan are not known at present.

15 Accordingly, utility-specific costs are not known.

16 Q. ON PAGE 21, LINE 11, OF HIS AMENDED DIRECT TESTIMONY, DR.

17 VITOLO RECOMMENDS THAT THE AVOIDED ENERGY COSTS OF

18 SOLAR PV RESOURCES ARE TO BE MODELED SEPARATELY FROM

19 ALL OTHER TECHNOLOGIES. DO YOU AGREE WITH THIS

20 APPROACH?

1   A.   No, I do not. This is not consistent with the Settlement Agreement in which

2   the parties agree to have the utilities use the PURPA and IRP methodology. The

3   methodology used by SCE&G calculates avoided costs for all resources over four

4   time periods: two daily periods of peak hours and off-peak hours within two

5   seasons, peak season and off-peak season. Once the avoided costs are calculated

6   by these time periods, the results can be used to evaluate the generation profile of

7   any DER resource by measuring the output of the DER resource during each of

8   those four time periods. For example, solar PV will likely generate much of its

9   energy during daily peak hours and therefore have a higher final value than a

10   biomass plant which is likely to generate evenly across all hours.

11 **Q.   DOES THIS CONCLUDE YOUR TESTIMONY?**

12 A.   Yes, it does.